CHAPTER 5

TRUNK AND EXTERNAL GENITALIA

Reconstructive problems of the trunk consist of restoring chest wall and abdominal wall structural integrity after major trauma or tumor removal.

I. CHEST WALL RECONSTRUCTION

A. Soft tissue loss only
   1. Large areas of full thickness skin loss +/- loss of subcutaneous/muscle tissue can be closed with a skin graft if a well vascularized bed is present and there is no exposed bone
   2. Flap coverage may be needed if nerve, blood vessels, or bone is exposed or if the tissue is irradiated

B. Chest wall defect including bone
   1. Small defects result in some paradoxical movement of the chest wall but are functionally insignificant
      a. Soft tissue coverage only is required for restoring chest wall integrity
   2. Large defects (>10 cm diameter; loss of more than three adjacent ribs) may result in a large flail segment and be functionally detrimental if not corrected
      a. Rigid reconstruction with either split rib grafts or alloplastic material such as polypropylene mesh may be needed in addition to skin flap coverage
      b. Previously irradiated areas often do not need skeletal reconstruction due to the rigidity of the tissue

C. Sternal Infection/Dehiscence
   1. Occurs in approximately 2% of median sternotomy wounds
      a. Managed successfully in a majority of cases with removal of sternal wires, generous debridement, appropriate antimicrobial therapy, and flap closure
   2. Flaps used for closure of sternal wounds include pectoralis major, rectus abdominis, omentum, and latissimus dorsi
   3. Some movement of the sternum usually occurs after successful closure. This is usually accepted by the patients

II. BREAST RECONSTRUCTION

The breast is important as a symbol of femininity and sexual intimacy. Significant abnormalities may include absence of the breast or gross enlargement. Many women will have significant improvement in body image with reconstruction of a breast of proportionate size.

A. Reconstruction after mastectomy for cancer
   1. The mastectomy defect varies in complexity
      a. All mastectomy defect wounds lack a breast mound and nipple/areolar complex
      b. More complex wound problems may include:
         i. Insufficient skin
         ii. Irradiated bed
   2. Treatment goal, as defined by the patient, will vary from looking acceptable in modest clothing to precise symmetry and attractiveness when unclothed. Individual needs are very different and require extensive preoperative counseling. The woman must know that there will be scars, where they will be, and that perfect replication of the premastectomy breast is not possible.
      a. Treatment options — immediate or delayed
         i. Local flaps +/- implant
         ii. Implant only (subpectoral)
         iii. Tissue expansion with subsequent implant
         iv. Latissimus dorsi myocutaneous flap and implant
         v. TRAM (Transverse Rectus Abdominis Myocutaneous Flap) — provides both skin coverage and breast volume
         vi. Free flaps e.g. gluteal
   3. Management of the opposite breast depends on the patient's concerns for symmetry and the risk of developing cancer. Management options: No procedure; mastopexy; reduction mammaplasty; simple mastectomy with immediate or delayed reconstruction; augmentation mammaplasty
   4. Nipple-areola reconstruction is generally performed secondarily with a combination of local flaps and skin grafts or tattoos

B. Subcutaneous mastectomy with reconstruction
   1. Involves removal of a majority of breast tissue (approximately 95%) with coring out of nipple to remove ductal tissue
   2. Immediate reconstruction usually with a subpectoral implant
   3. This is theoretically a prophylactic procedure. There is no clear evidence at this point that it is beneficial. Some women, in consultation with their physician, are opting for this treatment in certain high risk groups such as:
      a. Severe multifocal dysplasia/precancerous mastopathy
      b. Strong family history of breast cancer, e.g. mother and sister had breast cancer
      c. Fibrocystic disease or mastodynia is usually **not** an indication for this procedure
   4. Simple mastectomy is a better way to remove the maximum amount of breast tissue

C. Breast reduction
   1. Large breasts cause functional problems as well as aberrations in body image
      a. Shoulder, back, and neck pain
      b. Bra straps cutting into shoulders
      c. Symptoms of brachial plexus compression in more severe cases
      d. Submammary intertrigo
      e. Personal embarrassment and psychosocial problems, especially in young women
      f. Inability to fit clothes properly
   2. There are a variety of procedures to significantly reduce the breast size. It is not uncommon to remove greater than one kilogram from each breast. All procedures involve:
      a. Moving the nipple areola to a more superior position on the chest wall
      b. Most techniques maintain a vascular connection to the nipple areola complex, but this may need to be relocated as a full thickness graft in very large breasts
      c. Scars on the inferior portion of the breast and around the areola

   3. Studies document the significant relief of pain and intertrigo after surgery

III. ABDOMINAL WALL RECONSTRUCTION

The abdominal wall is a complex juxtaposition of muscle and fascia. Small defects can be closed primarily. Most significant defects are either from traumatic close-range blast injuries, synergistic gangrenous infections or tumor excision.

A. Skin and muscle loss
   1. Bowel serosa or muscularis will take a skin graft very well
      a. Appropriate as an intermediate procedure when more life threatening problems are pressing
   2. Permanent restoration of the integrity of the abdominal wall requires fascial and skin restoration
      a. Tensor fascia lata grafts or flaps, rectus femori flaps and lateral abdominal component flaps can be used for autogenous reconstruction
      b. Alloplastic material such as Marlex or Goretex may be used if needed

IV. PRESSURE SORES

Decubitus ulcer is a term of Latin derivation which refers to sores obtained in the lying position. Many pressure sores are acquired in the sitting position.

A. Etiology
   1. Pressure transmitted to the tissue, especially over bony prominences, exceeds the arteriolar or capillary pressure (35 mmHg). Ischemia of tissue results. Initiation of pressure ulceration may occur after as little as two hours of continuous pressure
   2. This may be complicated by inoculation of the ischemic tissue with resident flora which expands the area of injury and increases tissue necrosis
   3. Most patients are either paralyzed from spinal cord injury or compromised with severe illness, stroke or coma. They cannot recognize or respond to the painful stimulus of pressure

4. Pressure is greater over the bony prominences and muscle and fat are more susceptible to ischemia. Therefore, the deeper tissues have much more damage than the skin. A small wound on the surface often means substantial tissue necrosis below
5. The most common sites are over the greater trochanter, the ischial tuberosity, the sacrum, and the heel
6. Paraplegics have many other health problems that should be addressed:
    a. Nephrocalcinosis and urinary tract calculi
    b. Amyloidosis
    c. Recurrent urinary tract infections
    d. Contractures
    e. Soft tissue calcification
    f. Depression and social problems
    g. Problems of sexual function
    h. A patient can be septic from a pressure sore although the most likely source is the urinary tract

B. Classification
    1. Grade I — Erythema of skin
    2. Grade II — Skin ulceration and necrosis into subcutaneous tissue
    3. Grade III — Grade II plus muscle necrosis
    4. Grade IV — Grade III plus exposed bone/joint involvement

C. Treatment
    1. Prevention — best treatment
        a. Keep skin clean and dry
        b. Frequent turning of patient (at least every two hours)
        c. Pressure in special areas may be partially relieved with foam cushions or flotation mattresses
        d. Avoid shearing forces, i.e. sheepskin
    2. Preoperative
        a. Debride necrotic tissue
        b. Whirlpool and appropriate dressings, i.e. debriding/antimicrobial
        c. Systemic antibiotics if indicated
        d. X-rays, bone scan and/or bone biopsy to determine bony involvement

    3. Operative
        a. Adequate ulcer excision
        b. Excise involved bone and smooth out bony prominence
        c. Wound closure with adequate soft tissue pad (frequently myocutaneous flap)
        d. Potential benefits of myocutaneous flaps
            i. Reduces dead space
            ii. Increases padding
            iii. Improves blood supply to exposed bone
            iv. More dependable vascularity of skin component of flap

V. EXTERNAL GENITALIA

The problems most commonly encountered by the plastic surgeon are due to trauma, congenital defects, neoplastic defects, and infections.

A. Traumatic
    1. Avulsion of penis skin and scrotum
        a. Penis: temporary coverage by burying shaft under scrotum or suprapubic skin or split thickness skin graft
        b. Testes: cover with split-thickness skin grafts or bury in medial thighs
    2. Penile amputation
        a. Reattachment with microvascular techniques when possible provides a superior result, or
        b. Reconstruction by a variety of alternative methods

B. Congenital
    1. Ambiguous genitalia
        a. Gender assignment by 18 months of age — usually female
        b. Caused by adrenal hyperplasia, maternal drug ingestion, hermaphrodism
    2. Hypospadias
        a. Small meatus proximal to glans
        b. Surgery at 1 to 2 years of age
    3. Vaginal agenesis
        a. Often undiagnosed until amenorrhea noted
        b. Reconstruction in puberty by progressive dilation, grafts, or flaps

4. General
    a. One-third of patients with a genitourinary anomaly have more than one urinary tract abnormality
    b. Never circumcise a male child with an abnormal appearing penis; the tissue may be needed for future

C. Neoplastic defects
1. Vaginal defect 2º to bladder, bowel, or gyn tumor excision
    a. Lining made by skin graft, cutaneous flaps, or bowel
    b. Tube formed by omentum, gracilis or rectus abdominus flaps
2. Phallic reconstruction
    a. Need urethra reconstruction as well as penile reconstruction
    b. Radial forearm free flap, gracilis or rectus muscle flaps, or groin flaps are commonly used

D. Infectious
1. Hidradenitis suppurativa
    a. Chronic infection of apocrine sweat glands in groin, perineum, axilla
    b. Treat with local I&D or more radical excision if severe; antibiotics helpful
2. Fournier's gangrene
    a. Caused by mixed aerobic and anaerobic organisms
    b. Treat with debridement, antibiotics, and grafts or flaps

CHAPTER 5 — BIBLIOGRAPHY

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